

# Material Safety Data Sheet

# **STAINLESS**

# I. PRODUCT IDENTIFICATION

Distributor: Joseph T. Ryerson & Son, Inc.

Address: 2621 W. 15th Place Chicago, Illinois 60608

Chemical Name and Synonyms: STAINLESS STEELS

**Chemical Family:** Metals **Formula:** Not Applicable

**Emergency Telephone:** (312) 762-2121

# 11. PRODUCT DESCRIPTION AND HAZARDOUS INGREDIENTS/IDENTITY INFORMATION:

See Chart Inside For Listing

# III. PHYSICAL DATA

Melting Point F (C): Greater Than 2550 (1400)

Vapor Pressure: Not Applicable

Vapor Density (Air = 1): Not Applicable

Solubility in Water: Negligible

Specific Gravity ( $H_2O = 1$ ): Greater Than 7 % Volatile by Volume (%): Not Applicable

**Evaporation Rate:** Not Applicable

Appearance and Odor: Grayish to silvery odorless sheet, strip, plate, bar, structural shape, pipe or tubing.

#### IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point F (C): Not Applicable

Extinguishing Media: Use methods applicable to

surrounding area.

Flammable Limits: Not Applicable

Unusual Fire and Explosion Hazards: None

Special Fire Fighting Procedures: Use self-contained breathing apparatus for protection against degradation

products and fire fighting technique or agent(s) applicable to surrounding materials.

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		METAL	ALLOYING ELEMENTS															
	CAS Number:	7439-89-6	7439-96-5	7440-44-0	7723-14-0	7704-34-9	7740-21-3	7740-47-3	7740-02-0	7782-49-2	7440-25-7	7440-03-1	7440-50-8	7440-62-2	7439-98-7	7727-37-9	7440-32-6	7440-33-7
Grade		Iron	Manganese	Carbon	Phosphorus	Sulfur	Silicon	Chromiu	Nickel	elenium	Columbium	Tantalum	Copper	Vanadium	Molybdenum	Nitrogen	Titanium	Tungsten
201		>67	< 8.0	<0.2	<0.1	<0.1	<1.0	<18.0	<sup>'</sup> < 5.5									
202		>é3	<10.0	<0.2	<0.1	<0.1	<1.0	<19.0	< 6.0							<0.1		
203EZ		>65	< 6.5	<0.1	<0.1	<0.4	<1.0	<18.0	< 6.5							<0.1		
301	•	>70	< 2.0	<0.2	< 0.1	<0.1	<1.0	<18.0	< 8.0				<2.3		<0.5			
302	-	>67	< 2.0	<0.2	<0.1	<0.1	<1.0	<19.0	<10.0									
303		>67	> 2.0	<0.2	<0.2	< 0.1	<1.0	<19.0	<10.0									
303Se		>67	< 2.0	<0.2	<0.2	<0.1	<1.0	<19.0	<10.0						<0.1			
304		>66	< 2.0	<0.1	<0.1	<0.1	<1.0	<20.0	<10.5	<0.3								
304L		>64	< 2.0	<0.1	<0.1	<0.1	<1.0	<20.0	<12.0							<0.1		
305		>64	< 2.0	< 0.1	< 0.1	<0.1	<1.0	<19.0	<13.0							<0.1		•
309		>57	< 2.0	< 0.2	<0.1	<0.1	<1.0	<24.0	<15.0									
3098		>57	< 2.0	<0.1	<0.1	<0.1	<1.0	<24.0	<15.0									
310		>48	< 2.0	< 0.3	<0.1	<0.1	<1.0	<26.0	. <22.0									
3108		>48	< 2.0	<0.1	<0.1	<0.1	<1.0	<26.0	<22.0									
316		>61	< 2.0	<0.1	< 0.1	< 0.1	<1.0	<18.0	<14.0									
316L		>61	< 2.0	<0.1	<0.1	<0.1	<1.0	<18.0	<14.0						<3.0	<0.1		
317		>57	< 2.0	<0.1	<0.1	< 0.1	<1.0	<20.0	<15.0						<3.0	<0.1		
317L		>57	< 2.0	<0.1	<0.1	<0.1	< 1.0	<20.0	<15.0						<4.0			
321	~	>65	< 2.0	<0.1	< 0.1	<0.1	<1.0	<19.0	<12.0						<4.0			
330		>42	< 2.0	<0.2	< 0.1	<0.1	<1.5	<17.0	<37.0						•			
347		>41	< 2.0	<0.1	<0.1	<0.1	<1.0	<19.0	<13.0					•		-		
410		>74	< 1.0	<0.1	<0.1	<0.1	<1.0	<13.5			< 0.3	<0.3						
410S		>74	< 1.0	<0.1	< 0.1	<0.1	<1.0	<13.5										
414		>81	< 1.0	<0.1	<0.1	<0.1	<1.0	<13.5	< 2.5									
416		>81	< 1.5	<0.1	<0.1	<1.0	<1.0	<14.0					•		<0.6			
416Se		>82	< 1.5	<0.1	<0.1	<0.1	<1.0	<14.0		<0.3								
420		>86	< 1.0	<0.2	<0.1	<0.1	<1.0	<14.0										
422		>79	< 1.0	<0.3	<0.1	<0.1	<1.0	<14.0	< 1.0				•	<0.5	<1.3			<1.3
431		>78	< 1.0	<0.2	<0.1	<0.1	<1.0	<17.0	< 2.5									
440A		>78	< 1.0	<0.8	<0.1	<0.1	<1.0	<18.0		, .					<0.8			
440B		>78	< 1.0	<1.0	<0.1	<0.1	<1.0	<18.0	j						<0.8			
440C		>77	< 1.0	< 1.2 '	<0.1	<0.1	<1.0	<18.0							<0.8			
440F		>75	< 1.3	<1.2	<0.1	<1.0	<1.0	<18.0							<0.8			
440FSe		>78	< 1.3	<1.2	<0.1	<0.1	<1.0	<18.0		< 0.3					10.0			
501		>91	< 1.0	<0.3	<0.1	<0.1	<1.0	< 6.0		-0.0					<0.7			
409		>84	< 1.0	<0.1	<0.1	<0.1	<1.0	<11.8	< 0.5						<b>\0.7</b>		<0.8	
430		>79	< 1.0	<0.2	<0.1	<0.1	<1.0	<18.0	V 0.5								<b>~0.0</b>	
430F		>79 >77	< 1.3	<0.2	<0.1	<1.0	<1.0 <1.0	<18.0				•			<0.6			
430F ADE NAMES		/11	1.3	~0.2	~0.1	<b>~ 1.0</b>	~ I.U	~ 10.0							~0.0			
Nitronic 50		>F4	600	. <01	<b>(</b> 0.1	<0.1	<1.0	<23.5	<13.5		<0.3			<0.3		<b>CO. F</b>		
Nitronic 50 Nitronic 60		>54 >59	< 6.0 < 9.0	<0.1 <0.1	<0.1 <0.1	<0.1 <0.1	<1.0 <4.5	<23.5 <18.0	< 9.0		<b>~0.3</b>			<b>~0.3</b>		. <0.5		
			1		<0.1	<0.1		<15.5			<0.5	<0.5	<b>/1</b> =		<b>/05</b>	<0.2		
PH 15-5		>70 >74	< 1.0	<0.1			<1.0		< 5.5	•	<0.5 <0.5		<4.5		<0.5	<b>/</b> 0.		
PH 17-4		>74	< 1.0	<0.1	<0.1	<0.1	<1.0	<17.0	< 5.0		~0.5	<0.5			/a =	<0.1		
PH 13-8-Mo		>75	< 0.1	<0.1	<0.1	<0.1	<0.1	<13.3	< 8.5						<2.5	<0.1		<1.4

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	Aluminum	Carbon	. Chromium	Columbium	Copper	Iron	Manganese	Molybdenum	Nickel	Phosphorus	Selenium	Silicon	Sulfur	Tantalum	Titanium	Tungsten	Vanadium		
Contaminant and Exposure Limits (mg/m³)	As Welding Fume 5	Not Listed	As Soluble Cr Salts 0.5 0.5(VI	Not Listed	As Copper Cust 1 1	As Iron Oxide Fume 10 -	As Manganese Dust 5(c) 5(c)	As Soluble Mo Compounds 5 5	As Metal Ni 1 1	As Phosphorus (yellow) - 0.1 0.1	As Metal Se	As Nuisance Dust 15 10	As Sulfur Dioxide 13 5	As Metal Ta 5.0	As Ti, Titanium Dioxide 15 10	As Tungsten Dust 5	As Vanadium Pentoxide Dust 0.5(c) 0.05 resp.		
PEL TLV			As Metal and Insoluble Cr Salts 1 0.5		As Copper Fume 0.1 · 0.2	As Fe - 5	As Manganese Fume 5(c) 1	As Insoluble Mo Compounds 15 10	As soluble Ni Compounds 1 1								As Vanadium Pentoxide Fume 0.1(c) 0.05		

#### V. HEALTH HAZARD DATA

Applicable Statutory or Recommended Occupational Exposure Limits: No Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL) exists for aluminum alloys. See chart inside for listing of the individual constituents.

**Effects of Overexposure:** 

Acute - Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever; or produce flu-like symptoms.

Chronic - Aluminum: May initiate fibrotic changes to lung tissue

Bismuth: No chronic debilitating symptoms indicated from metal

Cobalt: Polycythemia, hyperlasia of bone marrow and thyroid, pericardial effusion and damage to alpha cells of pancreas.

Chromium: Skin ulceration, irritative dermatitis, allergic reaction, ulceration of the mucous membranes, perforation of the nasal septum, bronchial carcinoma, adenocarcinoma, mutagen(?) Listed NTPARC and IARC Monographs

Copper: No chronic debilitating symptoms indicated

Iron: Siderosis

Lead: Anemia, urinary dysfunction, metallic taste in mouth, weakness, constipation, nausea, nervous disorder

Manganese: Bronchitis, pneumonitis, lack of coordination Titanium: No chronic debilitating symptoms indicated

Vanadium: Emphysema, pneumonia

Zinc: Chromosomal anomalies in leukocytes reported. Arthritis, lameness and inflammation of the gastrointestinal tract reported from animal studies

# **Emergency and First Aid Procedures:**

In the event of acute exposure, remove to fresh air, administer oxygen, and seek a physician's assistance.

# VI. REACTIVITY DATA

Stable under normal conditions of use, storage and transportation.

For finely divided aluminum (e.g., small chips, fines):

With water: Generates hydrogen and heat slowly. Water/aluminum mixtures may be hazardous when confined.

With heat: Oxidizes at a temperature-dependent rate.

With strong oxidizers: Violent reaction with much heat generation.

With acids & alkalies: Reacts to generate hydrogen.

With halogenated compounds: Halogenated hydrocarbons can react violently with finely divided aluminum.

#### VII. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Not Applicable Waste Disposal Method: This material may be reclaimed for reuse.

# VIII. SPECIAL PROTECTION INFORMATION

If operations are such that atmospheric levels of contaminants exceed prescribed limits, provide local exhaust ventilation and/or adequate respiratory protection. Consult your regional codes or code of Federal Regulations, Title 29, Part 1910.252, Welding, Cutting and Brazing, 1910.134, Respiratory Protection, and 1910-Subpart Z, Toxic and Hazardous Substances.

# IX. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing: Not Applicable

Other Precautions: Plasma arc cutting or welding can generate ozone. Overexposure can result in mucous, membrane irritation as well as pulmonary changes including irritation, congestion and edema.